The objections to claims 2 and 3, and the rejection of claims 1-7 and 13 under 35 U.S.C. § 112, second paragraph are respectfully traversed. Without acquiescing in the rejection, claims 1-7 and 13 have been amended for clarity and to overcome numerous informalities. In view of the amendments to the claims, it is respectfully submitted that all objections and the rejection under 35 U.S.C. § 112 are overcome. Accordingly, reconsideration and withdrawal of the objection and rejection are respectfully requested.

The rejection of claims 1-5 and 7-13 under 35 U.S.C. § 102(b) or in the alternative under 35 U.S.C. § 103(a) over Goto et al. (U.S. Patent No. 5,815,063, hereinafter "Goto") is respectfully traversed. Without acquiescing in the rejection, claims 1-5, 7 and 13 have been amended for clarity. Accordingly, the rejection will be discussed with respect to the claims as amended.

Goto is directed to a positive temperature coefficient thermistor, and method of fabricating the same. Goto does not disclose or suggest any metal oxide expressed by AO_x.

The claimed invention, on the other hand, specifically recites a mixed sintered body $(M1\ M2)O_3 \cdot AO_x$ of a composite oxide expressed by $(M1\ M2)O_3$ having a perovskite structure and a metal oxide expressed by AO_x. Moreover, the thermistor material of the claimed invention has a mean particle size of less than 1.0 μm and the sintered body has a mean sintered particle size of 3 μm to 20 μm.

Goto, on the other hand only discloses that thermistor materials have a mean particle size of less than 1.3 μm and the sintered bodies have a mean sintered particle size in the range of 0.6 μm to 2.0 μm at a pulverization after a tentative sintering (*see*, *e.g.*,

col. 3, lines 38-44). Thus, there is no description related to an average particle size of a sintered body in Goto.

According to the claimed invention, it is possible to have durability against a reducing atmosphere because the mean sintered particle size is made to be in the claimed range of 3 μm to 20 μm (*see*, *e.g.*, paragraph 0028 bridging pages 8 and 9 of the specification). Furthermore, this makes it possible to increase the resistance of the mixed sintered body in the high temperature region (*see*, *e.g.*, paragraph 0031 of the specification). This advantageous effect is not disclosed by Goto, nor is it achievable by the structures disclosed by Goto.

It is axiomatic that in order for a reference to anticipate a claim, the reference must disclose, teach or suggest each and every feature of the claim. As set forth above, Goto fails to disclose, teach or suggest each and every feature of the claimed invention. In particular, Goto fails to disclose or suggest the specifically claimed metal oxide expressed by AO_x, and further fails to disclose or suggest the claimed mean sintered particle size. In fact, Goto teaches an entirely different mean particle size. Accordingly, Goto fails to anticipate the claimed invention.

Moreover, in addition to failing to anticipate the claimed invention, Goto fails to render the claimed invention obvious. First, no objective teaching in the prior art has been provided to overcome the fundamental deficiencies of Goto noted above with respect to the anticipation rejection. Second, Goto cannot provide the advantages achieved by the claimed structure. Moreover, Goto teaches away from the specifically claimed mean sintered particle size of the claims. Accordingly, Goto fails to render the

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claimed invention obvious. Therefore, in view of the foregoing, reconsideration and withdrawal of the rejections are respectfully requested.

The rejection of claims 1-5, 7-9 and 13 under 35 U.S.C. § 102(b) or in the alternative under 35 U.S.C. § 103(a) over Yamada et al. (U.S. Patent No. 6,143,207, hereinafter "Yamada") is respectfully traversed. Without acquiescing in the rejection, it is noted that claims 1-5, 7 and 13 have been amended for clarity. Accordingly, the rejection will be discussed with respect to the claims as amended.

Yamada is directed to a wide-range thermistor material and method of producing the same. There is no disclosure or suggestion in Yamada of a metal oxide expressed by AOx or of a composite oxide having a perovskite structure.

In complete contrast, the claimed invention specifically recites a composite oxide (M1 M2)O_3 having a perovskite structure and a metal oxide expressed by AO_x. The claimed composite oxide structure has relatively low resistance characteristics in a temperature range from room temperature up to about 1000°C, this composite oxide forms a mixed sintered body with the claimed metal oxide expressed by AO_x. Thus, the claimed invention provides the advantageous effect that it is possible to have a resistance in the range of room temperature to about 1000°C in the range of 100 Ω to 100 kΩ (*see*, *e.g.*, paragraph 0031 of the specification).

Because Yamada fails to disclose, teach or suggest each and every feature of the claimed invention, and fails to even recognize the advantages achieved by the claimed invention, Yamada can neither anticipate, nor render obvious, the claimed invention. Accordingly, reconsideration and withdrawal of the rejections are respectfully requested.

The rejection of claims 1-13 under 35 U.S.C. § 102(b) or in the alternative under 35 U.S.C. § 103(a) over Ogata et al. (German Patent No. DE 199 08 444, hereinafter "Ogata") is respectfully traversed. Without acquiescing in the rejection, it is noted that claims 1-7 and 13 have been amended for clarity. Accordingly, the rejection will be discussed with respect to the claims as amended.

Ogata is directed to a thermistor element having a sintered body of low electrical resistance perovskite compound and a low resistance aluminum oxide. Ogata further discloses that a mean particle size of the crystal particle is less than 1 μm, *i.e.*, in the range of several nm to several hundred nm (*see*, *e.g.*, page 13, lines 30-37 of Ogata).

In complete contrast, the claimed invention specifically recites a sintered body that forms the thermistor in which the mean sintered particle size of the body is in the range of 3 μm to 20 μm. Thus, the mean particle size of the claimed invention is very different from that of Ogata. The claimed invention provides the specific advantageous effect that it is possible to have durability against a reducing atmosphere because the mean sintered particle size is made to be in the claimed range of 3 μm to 20 μm (*see*, *e.g.*, paragraph 0028 bridging pages 8 and 9 of the specification).

Because Ogata fails to disclose, teach or suggest the claimed particle size, and specifically teaches away from the expressly recited mean sintered particle size, Ogata can neither anticipate the claimed invention, nor render it obvious. Accordingly, reconsideration and withdrawal of the rejections are respectfully requested.

The rejection of claims 1-7 and 10-13 under the judicially created doctrine of obviousness-type double patenting over U.S. Patent Application Serial No. 09/924,596 is respectfully traversed. Without acquiescing in the rejection, and to expedite prosecution,

submitted herewith is a Terminal Disclaimer disclaiming the term of any patent issuing from the present application that may extend beyond the term of any patent issuing from U.S. Patent Application Serial No. 09/924,596. It is noted that the Office Action erroneously refers to U.S. Patent Application Serial No. 09/929,870 in the double patenting rejection. In a telephone interview with Larry S. Nixon (Reg. No. 25,640), the Examiner indicated that this rejection is based solely on U.S. Patent Application Serial No. 09/924,596. Thus, the Terminal Disclaimer is directed solely to any patent issuing from U.S. Patent Application Serial No. 09/924,596. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

In view of the foregoing, it is respectfully submitted that the entire application is in condition for allowance. Favorable reconsideration of the application and prompt allowance of the claims are earnestly solicited.

Should the Examiner deem that further issues require resolution prior to allowance, the Examiner is invited to contact the undersigned attorney of record at the telephone number set forth below.

Respectfully submitted,

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MARKED-UP VERSION OF AMENDED CLAIMS

1. (*Amended*) A [reduction resistant] thermistor having durability against a reducing atmosphere comprised of a sintered body of a metal oxide obtained by shaping and firing a thermistor material, [including] the metal oxide[,] having a mean particle size of the thermistor material of less than 1.0 μm, and having a mean sintered particle size of the sintered body of the metal oxide of 3 μm to 20 μm, wherein the sintered body of the metal oxide is a mixed sintered body $(M1\text{-}M2)O_3 \cdot AO_x$ of a composite oxide [expressed by] (M1 M2)O_3 having a perovskite structure and a metal oxide [expressed by] AO_x, wherein, in the composite oxide (M1 M2)O_3, M1 is at least one [type of] element selected from elements of Group IIA of the Periodic Table and Group IIIA except for La and M2 is at least one [type of] element selected from elements of Group IIIB, Group IVA, Group VA, Group VIA, Group VIIA, and Group VIII of the Periodic Table, the metal oxide AO_x [has] having a melting point of at least 1400°C, and [the] a resistance (1000°C) of the AO_x alone in the shape of the thermistor is at least 1000Ω.

2. (*Amended*) A [reduction resistant] thermistor having durability against a reducing atmosphere as set forth in claim 1, wherein [when] the molar fraction of the composite oxide (M1 M2)O_3 in the mixed sintered body is [a] a and the molar fraction of the metal oxide AO_x is [b] b, [a and b] a and b satisfy the relations $0.05 \leq a < 1$, $0 < b \leq 0.95$, and $a+b=1$.

3. (*Amended*) A [reduction resistant] thermistor having durability against a reducing atmosphere as set forth in [any one of] claim 1, wherein M1 in the composite oxide $(M1\ M2)O_3$ is at least one [type of] element selected from Mg, Ca, Sr, Ba, Y, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Yb, and Sc and M2 is at least one [type of] element selected from Al, Ga, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, and Pt.

4. (*Amended*) A [reduction resistant] thermitor having durability against a reducing atmosphere as set forth in claim 1, wherein [A] A in the metal oxide AO_x is at least one element selected from B, Mg, Al, Si, Ca, Sc, Ti, Cr, Mn, Fe, Ni, Zn, Ga, Ge, Sr, Y, Zr, Nb, Sn, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, and Ta.

5. (*Amended*) A [reduction resistant] thermistor having durability against a reducing atmosphere as set forth in claim 1, wherein the metal oxide AO_x is at least one metal oxide selected from MgO, Al_2O_3, SiO_2, Sc_2O_3, TiO_2, Cr_2O_3, MnO, Mn_2O_3, Fe_2O_3, Fe_3O_4, NiO, ZnO, Ga_2O_3, Y_2O_3, ZrO_2, Nb_2O_5, SnO_2, CeO_2, Pr_2O_3, Nd_2O_3, Sm_2O_3, Eu_2O, Gd_2O_3, Tb_2O_3, Dy_2O_3, Ho_2O_3, Er_2O_3, Tm_2O_3, Yb_2O_3, Lu_2O_3, HfO_3, Ta_2O_5, $2MgO{\bullet}2SiO_2$, $MgSiO_2$, $MgCr_2O_4$, $MgAl_2O_4$, $CaSiO_3$, $YAlO_3$, $Y_3Al_5O_{12}$, Y_2SiO_5, and $3Al_2O_3{\bullet}2SiO_2$.

6. (*Amended*) A [reduction resistant] thermistor having durability against a reducing atmosphere as set forth in claim 1, wherein M1 in the composite oxide $(M1\ M2)O_3$ is Y, M2 is Cr and Mn, A in the metal oxide AO_x is Y, and the mixed sintered body $(M1\ M2)O_3{\bullet}AO_x$ is [expressed by] $Y(CrMn)O_3{\bullet}Y_2O_3$.

7. (*Amended*) A [reduction resistant] thermistor <u>having durability against a reducing atmosphere</u> as set forth in claim 1, including at least one of CaO, $CaCO_3$, SiO_2, and $CaSiO_3$ as a sintering aid.

8 ~~13~~. (*Amended*) A temperature sensor comprised of a [reduction resistant] thermistor <u>having durability against a reducing atmosphere</u> as set forth in claim 1.